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PIGEON ASSOCIATED PEOPLE DISEASES

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Feral pigeons (*Columbia livia*) are not harmless birds. Many potential infections of humans silently exist in pigeons which are not apparent. They have the potential for transmission of over 30 diseases to humans plus another ten to domestic animals. Environmental pollution from pigeon droppings is quite evident. Air pollution involves more than noxious gases from automobile exhausts and belching smokestacks. One serious air pollutant is air-borne fungi, which are agents for infectious diseases. There is much information written about the problem, but it remains primarily in the professional journals and technical references, neatly stacked away on library shelves. The objective of this paper is to provide a brief account of the major diseases and to assess their importance. Feral pigeons have been identified with mycotic, bacterial, protozoal, chlamydial, rickettsial, and parasitic diseases as well as dermatosis (Weber 1979).

MYCOTIC diseases are not transmitted from humans to humans. Perhaps this is why they do not make the headlines. The fungi causing the diseases are acquired by inhaling the fruiting bodies or spores along with particles of dust. The fungi live saprophytically in feces and soil.

Aspergillosis is caused by *Aspergillus fumigatus*. The fungus produces toxins which poison the victim's blood. Pigeons assist the spread of the spores in airborne dust. Blastomycosis is caused by *Blastomyces dermatitidis*. It primarily affects the lungs; the main route of infection is by inhalation of spores. The organism has been isolated from pigeon manure.

Candidiasis is caused by *Candida* spp., chiefly *C. albicans*. Nearly one-fourth of all mycotic deaths are caused by this yeast. It often affects the mouth, respiratory system, intestines, and urogenital tract, especially the vagina. Incidence of candidiasis (yeast infection) in women is an increasing problem. The discomfort of the itching, pain, and discharge caused by the growth of this fungus is significant enough to warrant the elimination of pigeons which are one of the three wild birds most frequently infected with *Candida*.

Cryptococcosis is caused by a systemic pathogenic yeast called *Cryptococcus neoformans*. No organ or tissue of the body is exempt. It very frequently involves the brain covering as cryptococcal meningitis. One Indianapolis victim spent 91 days in the hospital with cryptococcosis. The yeast is carried in the intestinal tract of pigeons and deposited in their feces (Newberry 1967). One Kansas City survey showed that 93% of the pigeon coops were infected.

Histoplasmosis is caused by *Histoplasma capsulatum*. It is interesting to note that the disease was suggested at one time as a biological warfare agent because of its air-borne route (Furcolow, personal communication, 1960). It is probably the second most significant fungus disease. The "summer flu" that midwesterners used to get is now thought to have been histoplasmosis (Personal communication, American Lung Association, 1974). It is basically a pulmonary disease but may extend to the liver, lymph nodes, and spleen. The organism may disseminate to the blood and bone marrow and be fatal. It may lodge in the eye to cause ocular histoplasmosis. Twenty-two cases were reported to the Indiana Board of Health in 1976. Pigeon feces fertilize the soil in such a way as to give the fungus competitive advantage over other soil microorganisms. The largest outbreak ever recorded occurred in Indianapolis during the winter of 1978-79 with over 450 confirmed cases. There were 18 deaths.

BACTERIAL DISEASES identified with pigeons are listed. Erysipeloid generally starts in a break in the skin and is accompanied with a sensation of burning, throbbing pain, and intense itching. It is caused by *Erysipelothrus insidiosus*. Pigeons are involved in its transmission.

Listeriosis is caused by *Listeria monocytogenes*. It causes changes in the cells of the nervous system. It may cause conjunctivitis, endocarditis, and skin infections. It can also cause meningitis in newborns, abortions, premature delivery, stillbirths, and death. The organism has been isolated from pigeons.

Parteeellosis is caused by a highly contagious bacteria, *Pasteurella multocida*. The

disease may be divided in four groups of syndromes: 1) infection of the upper respiratory tract as nasal discharge or conjunctivitis, 2) infection of the lower respiratory tract as bronchitis or pneumonia, 3) infection of internal organs as appendicitis or inflammation of the urinary tract, 4) abscessed wound infections. Pigeons can spread the bacteria through their droppings or nasal discharge. The organism can live as long as a month in pigeon manure or three months in a dead pigeon.

Salmonellosis is more than food poisoning. Gastroenteritis is the most common manifestation. Enteric fever or septicemia may follow several weeks later as a relapse. Septicemias often terminate fatally. Persistent infections are less common but very important. There may be an abscess or local infection as arthritis, bronchopneumonia, endocarditis, meningitis, osteomyelitis, or pyelonephritis. Pigeons are important in the spread of salmonellae, since the bacteria are left wherever the pigeons defecate (Müller 1965). They trample back and forth through their copious excretion on window ledges and air intake vents. Dusts to contaminate food or homes enter through air conditioners and ventilators. The most common salmonella isolated from pigeons is *Salmonella typhimurum* var. *Copenhagen*, which is found in about 2% of pigeon feces (Müller 1965).

Yersiniosis is a plague-like disease by *Yersinia pseudotuberculosis* and *Y. enterocolitica*. The disease is clinically indistinguishable from appendicitis. Both diseases cause fever, nausea, headache, hard and painful stomachs. Because of the similarity, there were 32 school children hospitalized in Oneida County, New York in September 1976. Fourteen were reported to have had unnecessary appendectomies. *Y. enterocolitica* serotype 8 was isolated from the ill children. It was first isolated from pigeons in 1916. Transmission may be through the feces, eggs, or ticks of pigeons (Hubert 1972).

PROTOZOAN diseases include American trypanosomiasis, toxoplasmosis, and trichomoniasis. American trypanosomiasis is caused by *Trypanosoma cruzi*. There is no vaccine, effective treatment, or cure for the disease. It is transmitted through the feces of infected triatomid bugs, as the pigeon kissing bug (*Triatoma rubrofasciata*). The bugs tend to feed at night while the victim is asleep the bug defecates during or soon after engorgement, and most human infections occur when the bug feces are rubbed into eyes or mucous membranes following a bite.

Toxoplasmosis may be one of the most widespread zoonotic diseases in the United States. It is caused by *Toxoplasma gondii*. It has been shown to cause abortions in women (W.J. Schneider, personal communication, 1977). The organism seems to have an affinity for brain tissue; it may cause mental retardation and death. Pigeons frequently transmit toxoplasmosis through fecal contamination, respiratory droplets, eye secretions, contact with infected tissue, or through ectoparasites.

Trichomoniasis is caused by *Trichomonas gallinae*. It may affect the genital tract. Pigeons are considered the primary host, with about 80-90% of the adults infected.

VIRAL diseases include encephalitis, meningitis, and Newcastle. Eastern equine encephalomyelitis (EEE) is the most deadly of the North American arbovirus diseases. It has been known to cause mental retardation, convulsions, and paralysis. The mortality rate may be around 60%. Pigeons are considered an amplifying host for the virus (Fothergill et. al. 1938).

St. Louis encephalitis (SLE) affects the nervous system, ranging from complete recovery to disorganization, paralysis, coma, and death. The mortality rate is usually 5-10%, in some cases up to 33%. Pigeons, English sparrows, and house finches are the three birds labeled as main reservoirs of SLE.

West Nile encephalitis ranges from mild to fatal infections. The virus has been isolated from pigeons.

Western equine encephalomyelitis is much more present and dangerous than most people think. The fatality rate has been between 5 and 15%. Children under one year of age may never recover from an infection of the virus, often becoming total vegetables. Pigeons are one of the amplifying hosts (W.F. Rathel, personal communication, 1977).

Meningitis causes as inflammation of the brain and its covering. Pigeons are subject to meningo-encephalitis. Newcastle disease often involves conjunctivitis, lacrimation, and a mild influenza-like infection. Pigeons are the third largest common carrier; the virus has been detected in their feces.

CHLAMYDIAL and RICKETTSIAL diseases. Chlamydiosis, caused by *Chlamydia psittaci*, is a generalized infectious disease that causes a flu-like respiratory infection with high fever, severe headache, and generalized aches and pains. Mortality is usually

restricted to the old, the weak, or those with concurrent disease. Pigeons are the most common and consistent source of all known hosts (Terskiph 1961). Over half of the pigeon population is or has been infected.

Q fever is caused by *Coxiella burnetii*. It is characterized by a sudden onset of pneumonitis, sometimes causing death. Pigeons are involved as carriers (Syrucsek et al. 1956). Investigators have isolated *C. burnetii* from the Kidneys of a large number of pigeons. The disease can be transmitted by infected ticks, ingestion, or by inhalation of dust contaminated with the organism.

PARASITIC WORMS include cestodes and trematodes. Taeniasis by large tapeworm is caused by *Taenia saginata*, with specimens up to 50 feet having been recovered. Pigeons have been incriminated as potential vectors. Schistosomiasis, one of the most prevalent diseases throughout the world, is caused by a water-borne trematode. Pigeons are associated with flukes in the watery areas where they exist. Other pigeon-associated trematodes include *Echinoparyphium paraulum*, *Echinoparyphium recurvatum*, *Echinostoma revolutum*, *Haplorchis pulimio*, and *Hypoderaeum conoideum*.

DERMATOSIS. Acariasis is caused by infection of mites. Bird mites were responsible for a case of pruritis in a North Carolina hospital. The mites originated in a pigeon nest in the ventilator.

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